

DDTC (R1 = R2 SERIES) KA

NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

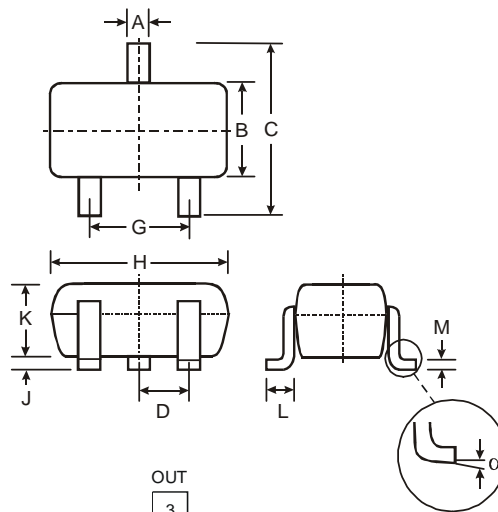
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device, Note 3 and 4**

Mechanical Data

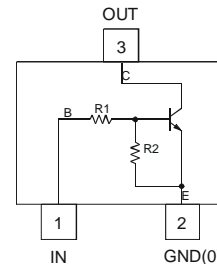
- Case: SC-59
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Copper leadframe).
- Terminal Connections: See Diagram
- Marking Information: See Table Below & Page 4)
- Ordering Information: See Page 4
- Weight: 0.008 grams (approximate)

P/N	R1, R2 (NOM)	Type Code
DDTC123EKA	2.2K Ω	N04
DDTC143EKA	4.7K Ω	N08
DDTC114EKA	10K Ω	N13
DDTC124EKA	22K Ω	N17
DDTC144EKA	47K Ω	N20
DDTC115EKA	100K Ω	N24

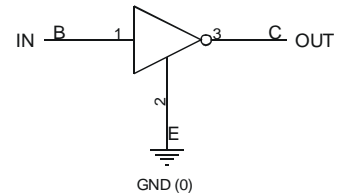


SC-59		
Dim	Min	Max
A	0.35	0.50
B	1.50	1.70
C	2.70	3.00
D	0.95	
G	1.90	
H	2.90	3.10
J	0.013	0.10
K	1.00	1.30
L	0.35	0.55
M	0.10	0.20
α	0°	8°

All Dimensions in mm



Schematic and Pin Configuration



Equivalent Inverter Circuit

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (2)	V _{CC}	50	V
Input Voltage, (1) to (2)	V _{IN}	DDTC123EKA: -10 to +12 DDTC143EKA: -10 to +30 DDTC114EKA: -10 to +40 DDTC124EKA: -10 to +40 DDTC144EKA: -10 to +40 DDTC115EKA: -10 to +40	V
Output Current	I _O	DDTC123EKA: 100 DDTC143EKA: 100 DDTC114EKA: 50 DDTC124EKA: 30 DDTC144EKA: 100 DDTC115EKA: 20	mA
Output Current	I _C (Max)	100	mA
Power Dissipation	P _d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R _{θJA}	625	°C/W
Operating and Storage Temperature Range	T _j , T _{STG}	-55 to +150	°C

- Notes:
1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
 2. No purposefully added lead.
 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 4. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	V _{I(off)}	0.5	1.1	—	V	V _{CC} = 5V, I _O = 100μA
	V _{I(on)}	—	1.9	3		V _O = 0.3V, I _O = 20mA, DDTC123EKA V _O = 0.3V, I _O = 20mA, DDTC143EKA V _O = 0.3V, I _O = 10mA, DDTC114EKA V _O = 0.3V, I _O = 5mA, DDTC124EKA V _O = 0.3V, I _O = 2mA, DDTC144EKA V _O = 0.3V, I _O = 1mA, DDTC115EKA
Output Voltage	V _{O(on)}	—	0.1	0.3	V	I _O /I _I = 10mA/0.5mA, DDTC123EKA I _O /I _I = 10mA/0.5mA, DDTC143EKA I _O /I _I = 10mA/0.5mA, DDTC114EKA I _O /I _I = 10mA/0.5mA, DDTC124EKA I _O /I _I = 10mA/0.5mA, DDTC144EKA I _O /I _I = 5mA/0.25mA, DDTC115EKA
Input Current	I _I	—	—	3.8 1.8 0.88 0.36 0.18 0.15	mA	V _I = 5V
Output Current	I _{O(off)}	—	—	0.5	μA	V _{CC} = 50V, V _I = 0V
DC Current Gain	G _I	20 20 30 56 68 82	—	—	—	V _O = 5V, I _O = 20mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA
Input Resistor (R ₁) Tolerance	ΔR ₁	-30	—	+30	%	—
Resistance Ratio	R ₂ /R ₁	0.8	1	1.2	—	—
Gain-Bandwidth Product*	f _T	—	250	—	MHz	V _{CE} = 10V, I _E = 5mA, f = 100MHz

* Transistor - For Reference Only

Typical Curves – DDTC143EKA

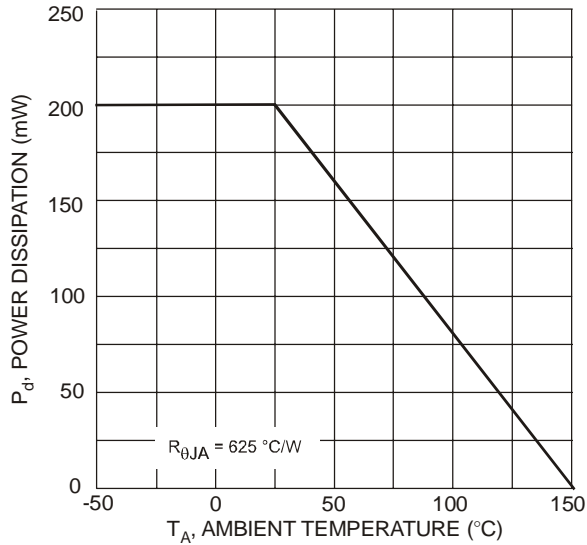


Fig. 1 Derating Curve

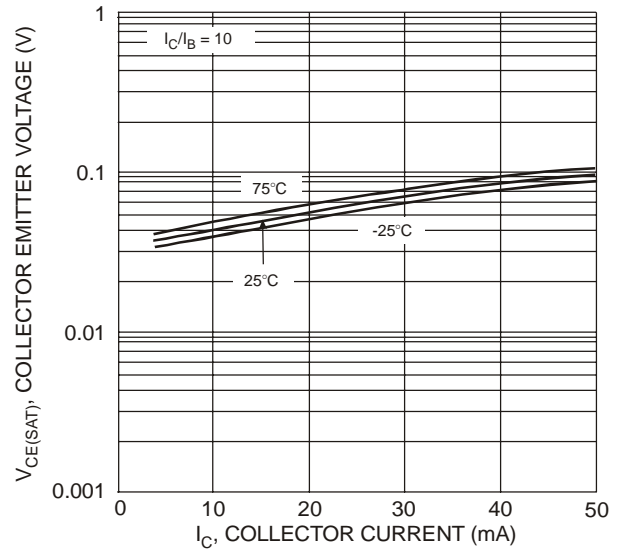


Fig. 2 V_{CE(SAT)} vs. I_C

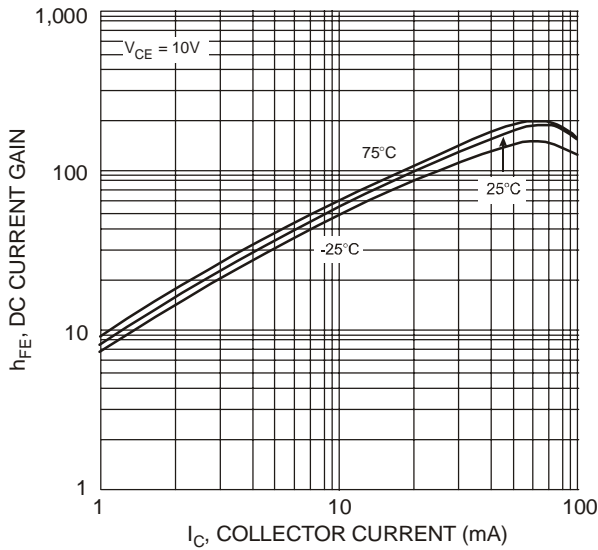


Fig. 3 DC Current Gain

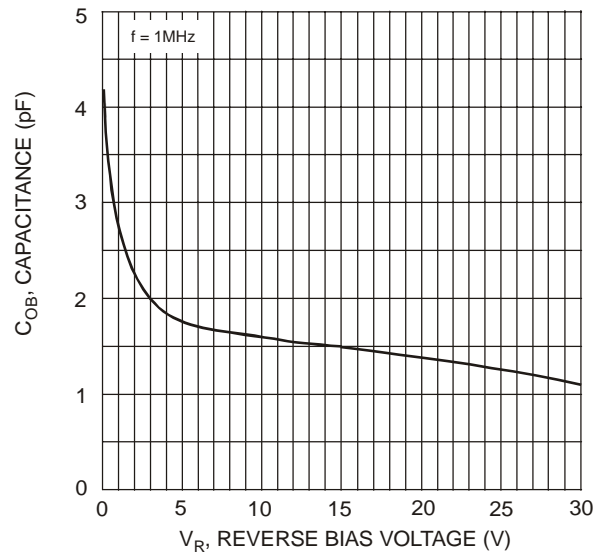


Fig. 4 Output Capacitance

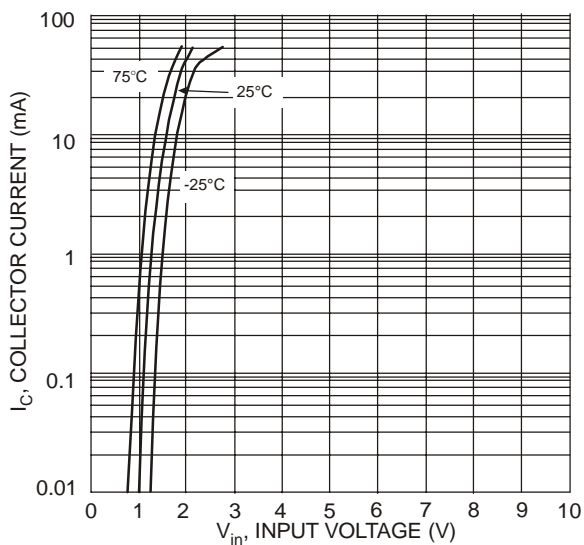


Fig. 5 Collector Current vs. Input Voltage

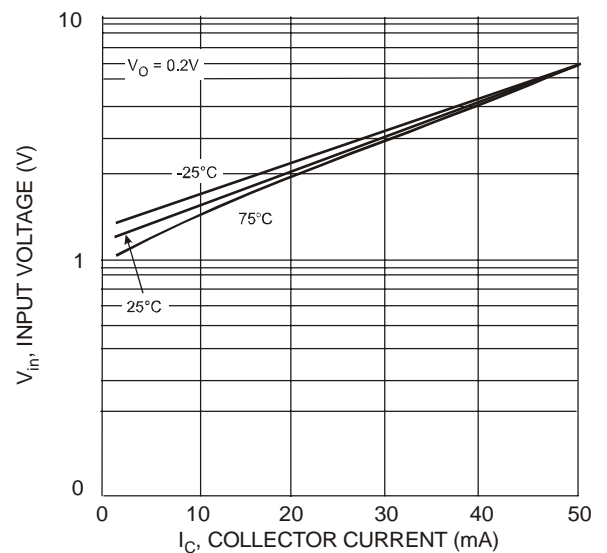


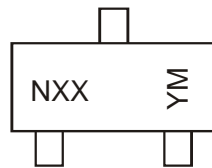
Fig. 6 Input Voltage vs. Collector Current

Ordering Information (Note 4 & 5)

Device	Packaging	Shipping
DDTC123EKA-7-F	SC-59	3000/Tape & Reel
DDTC143EKA-7-F	SC-59	3000/Tape & Reel
DDTC114EKA-7-F	SC-59	3000/Tape & Reel
DDTC124EKA-7-F	SC-59	3000/Tape & Reel
DDTC144EKA-7-F	SC-59	3000/Tape & Reel
DDTC115EKA-7-F	SC-59	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



NXX = Product Type Marking Code, See Table on Page 1
 YM = Date Code Marking
 Y = Year ex: T = 2006
 M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	N	P	R	S	T	U	V	W	X	Y	Z

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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